
#BEAT THE HEAT
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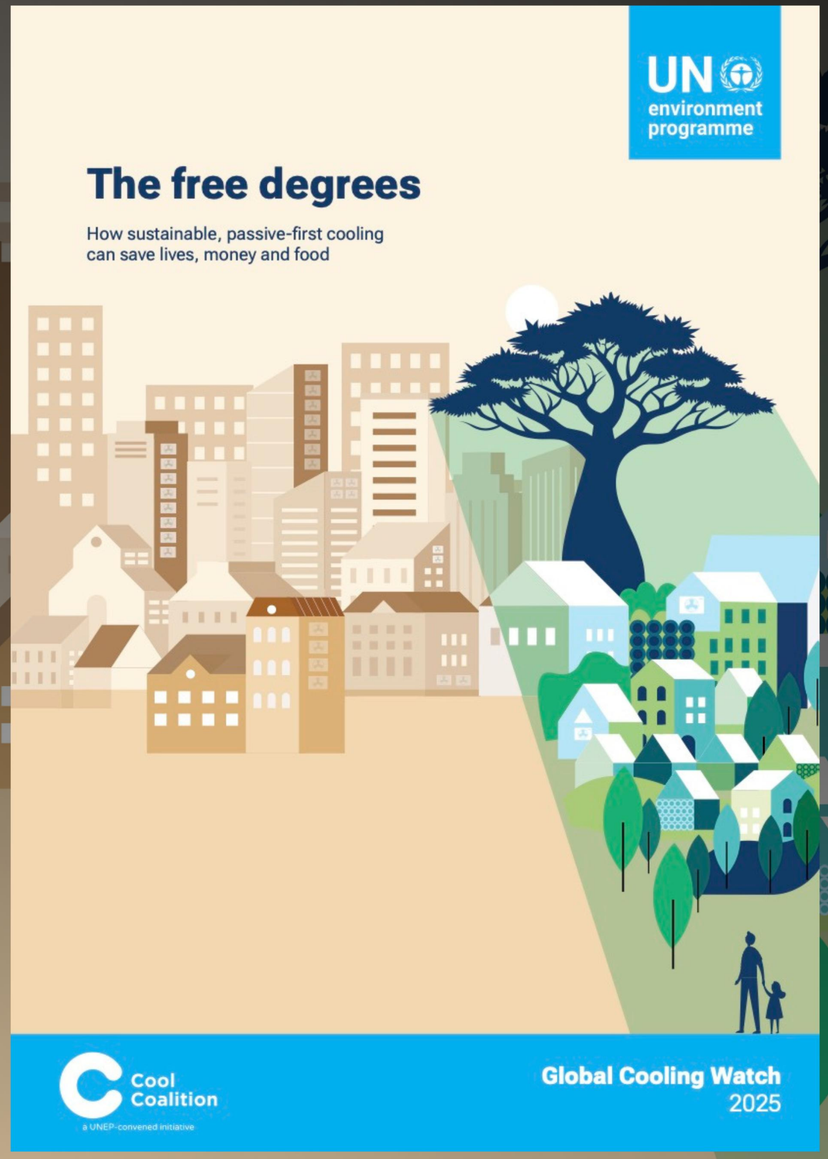

BetterWork

The Heat is On:

How heat stress impacts the apparel industry, jobs and worker health

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December 11, 2025

International Labour Organization

IFC International Finance Corporation WORLD BANK GROUP

Creating Markets, Creating Opportunities

ILR Global Labor Institute

betterwork.org

Key Findings of the report

- **By 2030**, the apparel industries in Vietnam, Cambodia, Pakistan, and Bangladesh could forego **$65.8 billion in potential export earnings and create 1 million fewer new jobs** due to climate impacts.

- **By 2050,** employment across these four countries could be **8.64 million lower** if no adaptation measures are taken.

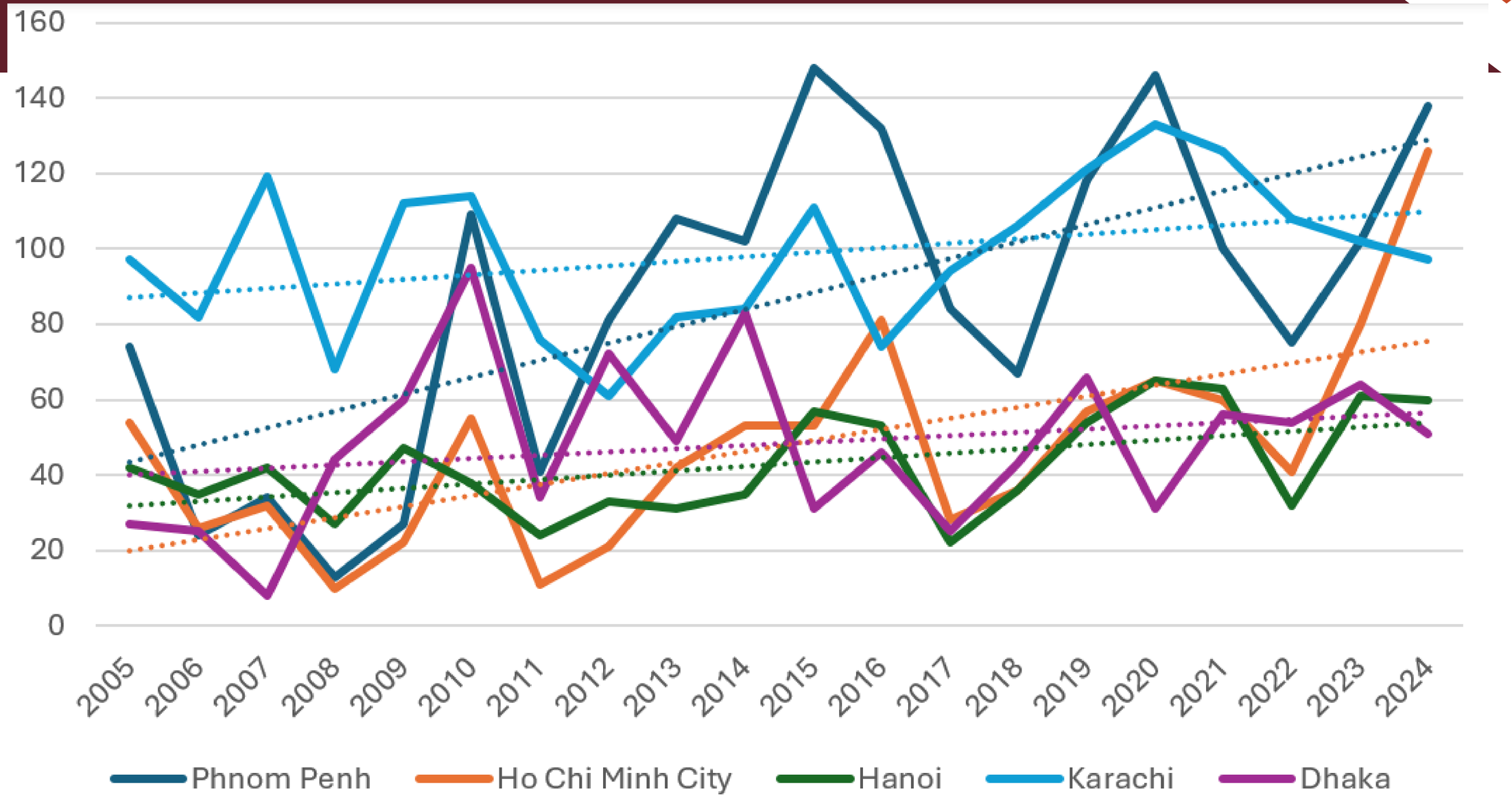
- Extreme weather is already disrupting production, delaying orders, and threatening workers' health and incomes.

Days over 35°C by production center, 2005 - 2024

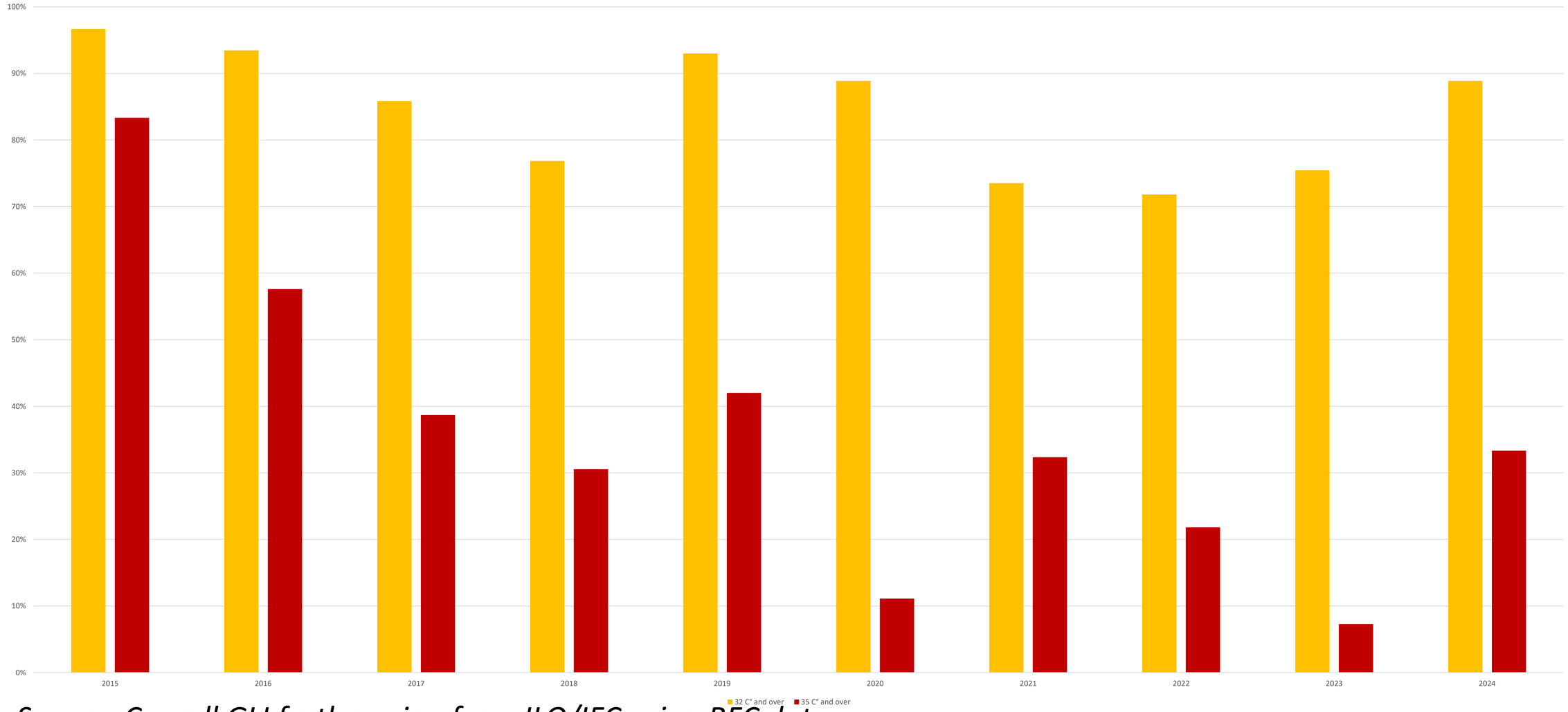
Center	Country	Exceedance days, 2005–2009	Exceedance days, 2010–2014	Exceedance days, 2015–2019	Exceedance days, 2020–2024*	Change (%), 2005–2009 vs. 2020–2024
Delhi	India	141.0	118.2	140.6	115.6	-18.0
Karachi	Pakistan	95.6	83.4	101.2	113.2	18.4
Phnom Penh	Cambodia	34.4	88.2	109.8	112.2	226.2
Yangon	Myanmar	76.4	91.6	98.0	84.6	10.7
Cairo	Egypt	71.8	69.2	88.2	78.6	9.5
Bangkok	Thailand	80.8	68.6	62.0	76.6	-5.2
Ho Chi Minh	Vietnam	28.8	36.4	51.0	74.4	158.3
Managua	Nicaragua	57.8	60.4	71.8	72.4	25.6
Tiruppur	India	39.0	69.6	73.4	67.2	72.3
Hanoi	Vietnam	38.6	32.2	44.4	56.2	45.6
Dhaka	Bangladesh	32.8	66.6	42.2	51.2	56.1
Manila	Philippines	21.8	31.6	42.2	42.4	94.5

Source: Cornell GLI 'Hot Air' from Copernicus data.

Days over 35°C by production center, 2005 - 2024

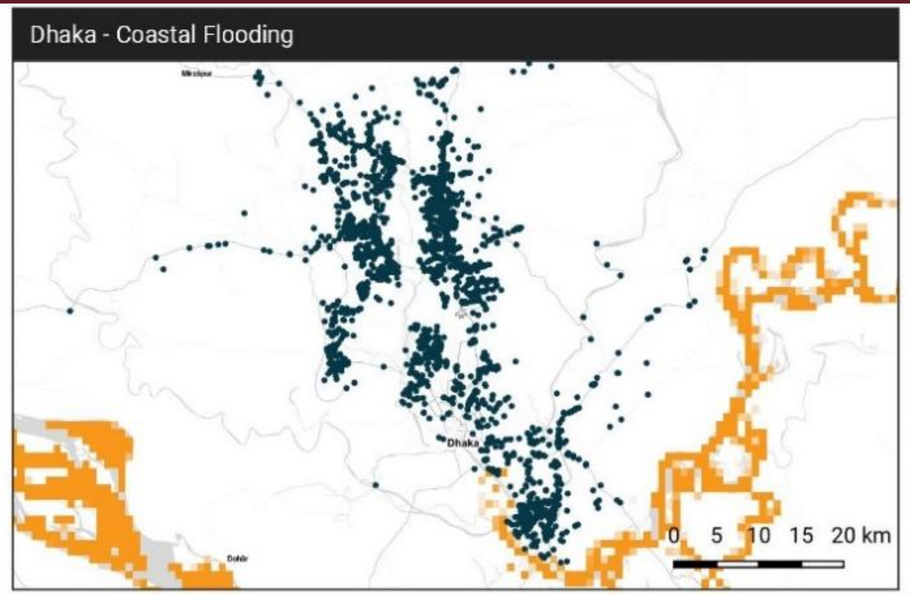


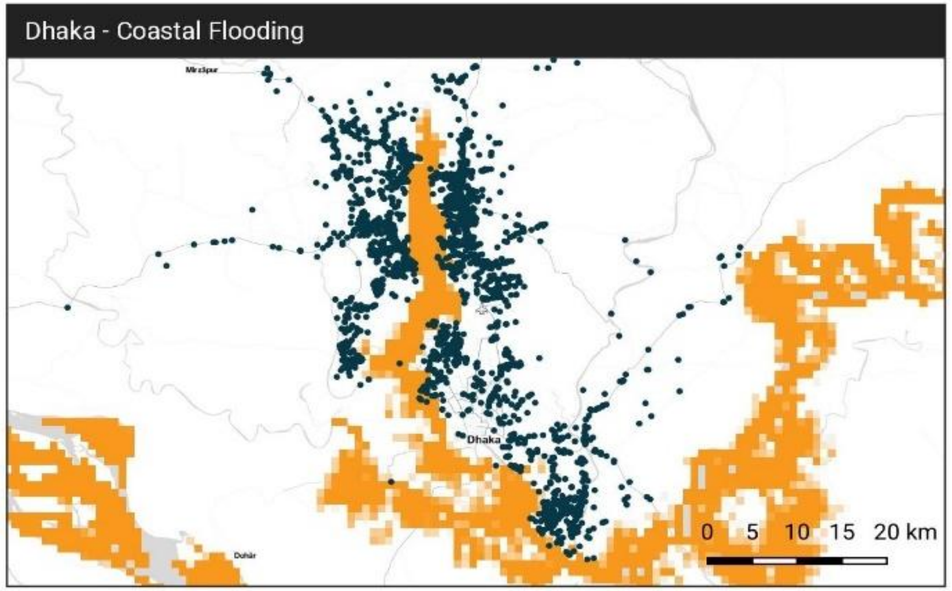
Cambodian apparel production, indoor temps. > 32 and > 35°C March - May, 2015 - 2024

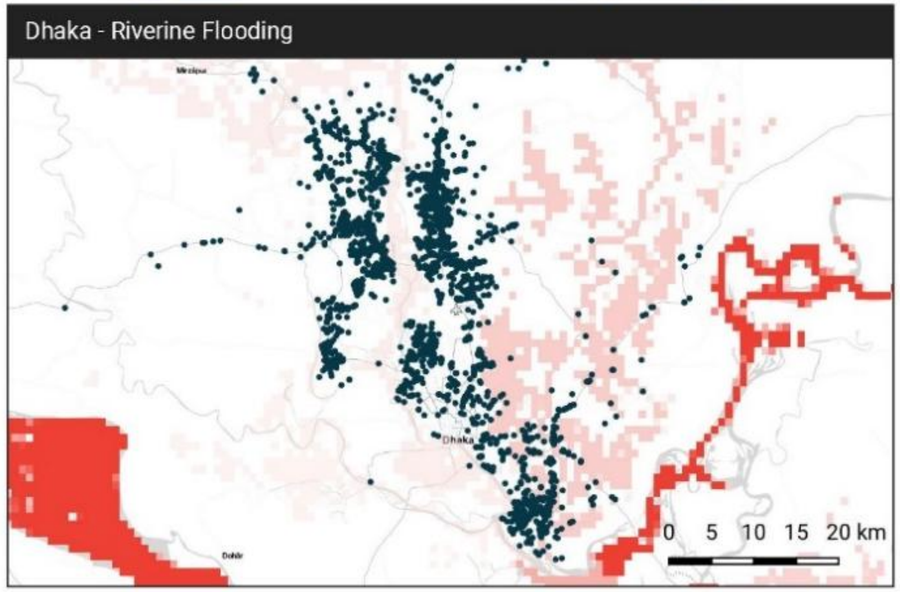


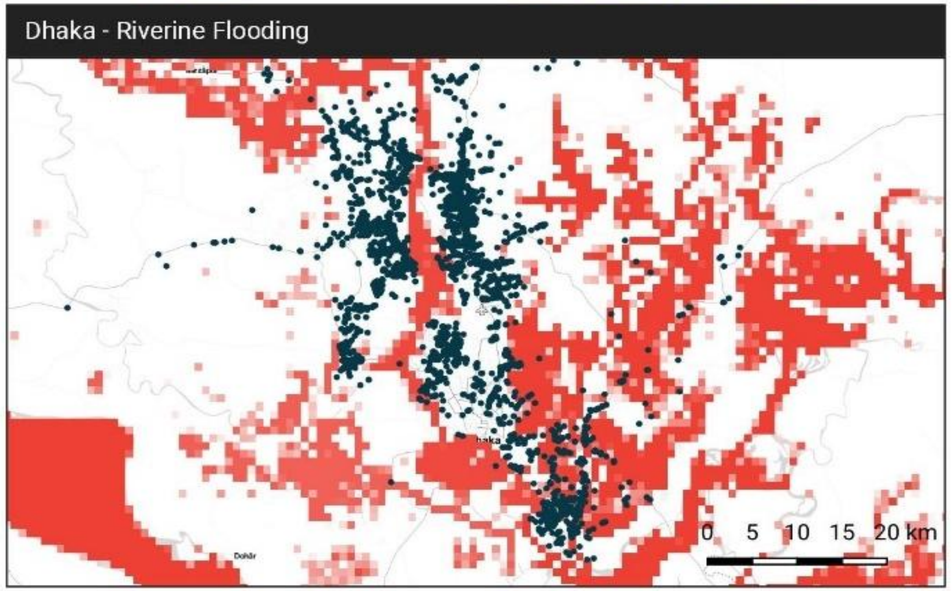
Source: Cornell GLI forthcoming from ILO/IFC using BFC data.

Intense Flooding, Dhaka, 2030 vs. 2050









Sources: Schroders, WorldPop, World Resources Institute. Flooding based on 2030 RP-2 and 2050 RP-10 events, RCP4.5.

Economic Damage to Export Earnings 2030 and 2050

Table 2. Combined heat- and flood-related impacts for apparel export earnings under climate-adaptative and high-heat and flooding scenarios, 2030 and 2050.

Country	Year	Climate-adaptive export earnings (USD)	High heat + flood earnings (USD)	Change (USD)	Change (percent)
Bangladesh	2021	46.55 b.			
	2030	122.01 b.	95.22 b.	(26.78) b.	-21.95%
	2050	1,038.22 b.	326.90 b.	(711.32) b.	-68.51%
Cambodia	2021	15.24 b.			
	2030	35.64 b.	28.89 b.	(6.75) b.	-18.94%
	2050	235.41 b.	79.09 b.	(156.32) b.	-66.40%
Pakistan	2021	9.07 b.			
	2030	24.54 b.	16,95 b.	(7.59) b.	-30.94%
	2050	224.35 b.	43,70 b.	(180.65) b.	-80.52%
Vietnam	2021	56.99 b.			
	2030	116.80 b.	92,04 b.	(24.77) b.	-21.20%
	2050	575.46 b.	197.12 b.	(378.34) b.	-65.74%

Sources: Cornell GLI, Atlas of Economic Complexity, Katalyst Institute, Schroders, WRI, EU Copernicus based on SSP 2-4.5 and RP10 Event (RCP 4.5).

Damage to Employment - 2030 and 2050

Table 3. Combined heat- and flood-related impacts for apparel employment under 'climate-adaptative' and high-heat and flooding scenarios, 2030 and 2050.

Country	Year	Climate-adaptive employment	High heat + flood employment	Change	Change (percent)
Bangladesh	2021	4.22 m.			
	2030	4.83 m.	4.57 m.	(0.25) m.	-5.29%
	2050	6.31 m.	5.04 m.	(1.27) m.	-20.17%
Cambodia	2021	0.70 m.			
	2030	0.94 m.	0.89 m.	(0.05) m.	-5.63%
	2050	1.70 m.	1.14 m.	(0.56) m.	-32.76%
Pakistan	2021	2.75 m.			
	2030	3.43 m.	3.14 m.	(0.30) m.	-8.65%
	2050	5.37 m.	3.51 m.	(1.85) m.	-34.56%
Vietnam	2021	2.97 m.			
	2030	4.70 m.	4.34 m.	(0.35) m.	-7.53%
	2050	11.70 m.	6.74 m.	(4.96) m.	-42.38%

Sources: Cornell GLI, Atlas of Economic Complexity, Katalyst Institute, Schroders, WRI, EU Copernicus based on SSP 2-4.5 and RP10 Event (RCP 4.5).

Regulations on high heat

Table 3. Examples of legislation on maximum temperature thresholds in the workplace

Country	Heat Stress Indicator	Safety Threshold (Work Intensity/Risk)
Brazil	WBGT	31.7–33.7°C for 'very low intensity' work 20.7–24.7°C for 'very high intensity' work
China	Air temperature	37–39°C is considered 'high risk' Above 39°C is an 'extreme risk'
India	WBGT	30°C is the safe threshold for all work
Viet Nam	Air temperature (indoor only)	34°C for 'light' work, 32°C for 'medium' effort, 30°C for 'heavy' work
Thailand	WBGT	34°C for 'low intensity' work, 32°C for 'moderate' work, 30°C for 'very high intensity' work

Actions are underway

- Governments are setting and enforcing new standards on workplace heat, ventilation, rest breaks, and access to water.
- Global apparel brands are adopting voluntary standards to better manage extreme heat and flooding risks in their supply chains (VF, Nike, Levis as examples).
- Worker organizations are pushing for workplace heat standards and protocols in national policy and binding agreements.
- Manufacturers are training workers to identify and respond to heat stress and related illnesses.
- IFC initiatives on cooling can help manufacturers adapt to extreme heat and lower emissions from cooling.

Report recommendations

- Set and consistently enforce mandatory and voluntary standards (VF)
- Train workers to identify heat stress symptoms and access medical care and consult with workers on production schedules to lower impact on health & incomes – pay attention to specific needs of women
- Regulators can treat heat stress and floods as 'health hazards' entitling workers to paid leave
- Treat extreme climate events as ‘force majeure’ (freeing manufacturers from contractual obligations vis a vis customers/brands)
- Invest in climate adaptation and cooling (IFC initiatives)



Solutions: IFC’s Sustainable Cooling Initiative & Tools for the Built Environment

IFC'S SUSTAINABLE COOLING INITIATIVE: "FIVE BY FIVE" PLAN

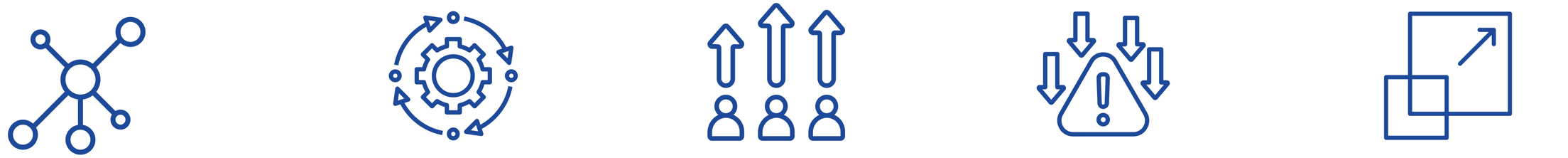
FIVE FOCUS SECTORS

- DISTRICT COOLING
- COOLING FOR GREEN BUILDINGS
- CONSUMER & SME FINANCE
- INNOVATION FOR MANUFACTURING & AGRIBUSINESS
- COLD CHAINS & LOGISTICS

COOLING AS A SERVICE

FIVE ENGAGEMENT PILLARS

- THOUGHT LEADERSHIP, MARKET MAPPING
- TRANSFORMATIVE COOLING SYSTEMS
- INVESTMENT READINESS
- DE-RISK FINANCING
- OPERATIONALIZE & SCALE UP



IFC's Sustainable Cooling Initiative is funded by the UK Government's Department for Energy Security & Net Zero

Further information: [IFC's Sustainable Cooling Website]

IFC CAN SUPPORT CLIENTS THROUGH A MENU OF INTERVENTIONS WITH THE AIM OF PILOTING INNOVATIVE TECHNOLOGIES

1. Cooling as part of Decarbonization Strategy

2.Implementation Support for Innovation

3. Finance & Disclosure

Supporting the client journey toward innovation for cooling

KEY COMPONENT

Market Support

- Standard Setting
- Client preparedness and training
- Market mapping, data collection

Strategic Support

- Audit & benchmarking of assets and processes
- Firm-wide strategy and solutions
- Pre-feasibility and feasibility studies

Technical Support

- Technical Assistance
- Operational and business model enhancement

Piloting Innovation

- Piloting New Technologies
- Matchmaking providers and adopters

Transaction Support

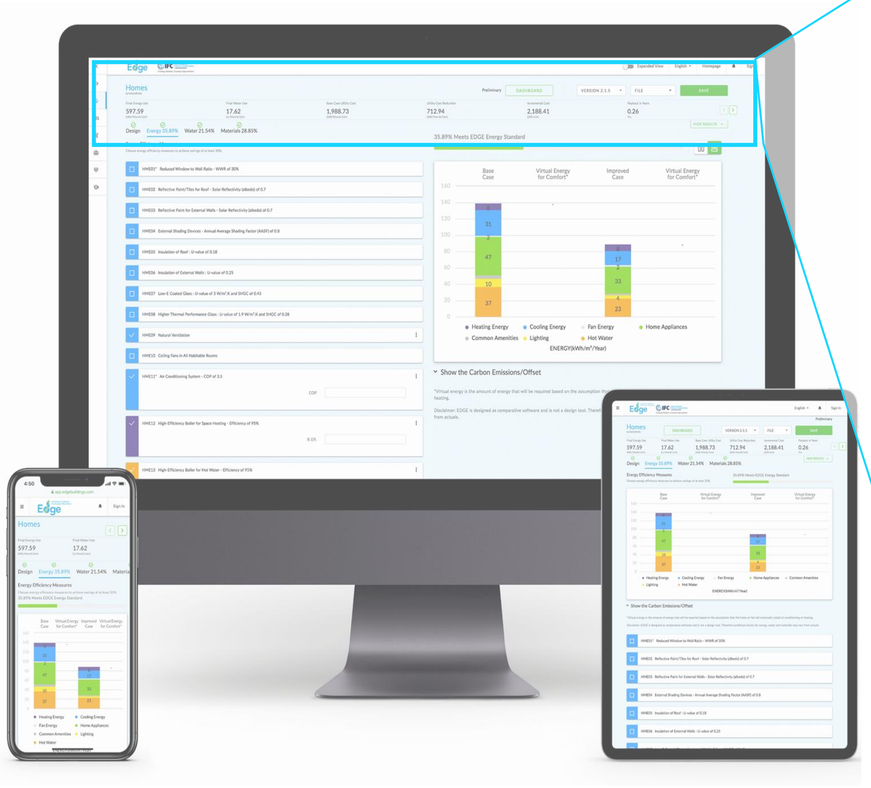
- De-risking finance
- Financial structuring
- Reporting & Marketing

Focus on Transformative Cooling Systems with a view toward IFC's Investment

IFC's Sustainable Cooling Initiative is funded by the UK Government's Department for Energy Security & Net Zero

Further information: IFC's Sustainable Cooling Website

IFC'S EDGE PROGRAM HELPS FACTORIES UNDERSTAND INCREASED HEAT AND CALCULATE THE PAYBACK OF EACH EFFICIENCY MEASURE



Energy 36.52% | Water 32.77% | Materials 47.67%

Progress Toward Certification

Utility Cost Reduction	Incremental Cost	Payback in Years
9,788.45 PAB/Month	49,753.26 PAB	0.42 Yrs.

Incremental Cost and Payback

Embodied Energy Savings	Energy Savings	Water Savings
1,056.04 MJ/m²	506.90 MWh/Year	4,520.42 m³/Year

Energy, Water, & Materials Savings

Operational CO_2 Savings	Carbon Emissions
155.89 tCO_2/Year	265.92 tCO_2/Year

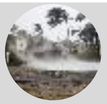
Carbon Tracking

Further resource: EDGE website
EDGE YouTube Channel

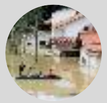
RESILIENCE PREPAREDNESS CAN BE ASSESSED, IMPROVED, AND DISCLOSED USING GLOBAL STANDARDS THROUGH THE BRI PROGRAM

Building Resilience Index is an innovation of IFC, a member of the World Bank Group.

Identify Risk



WIND



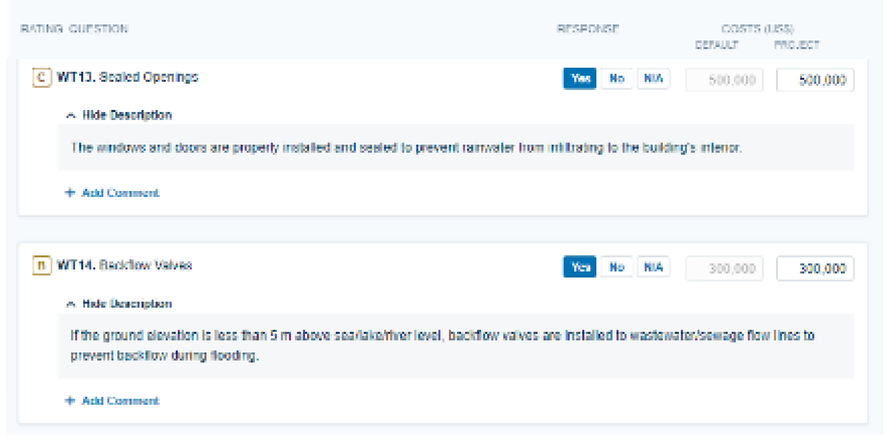
WATER

FIRE

GEO-SEISMIC

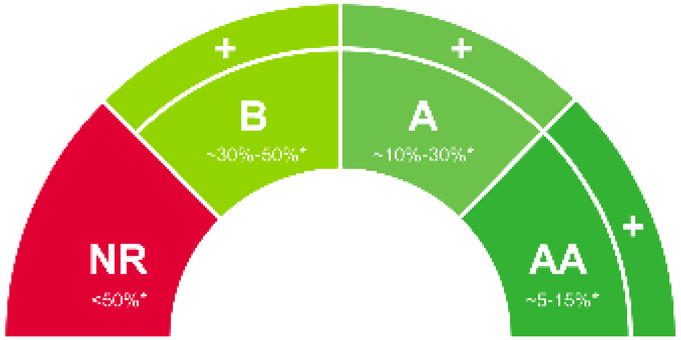
Manage Risk

PHYSICAL INTEGRITY



OPERATIONAL CONTINUITY

Disclose Risk

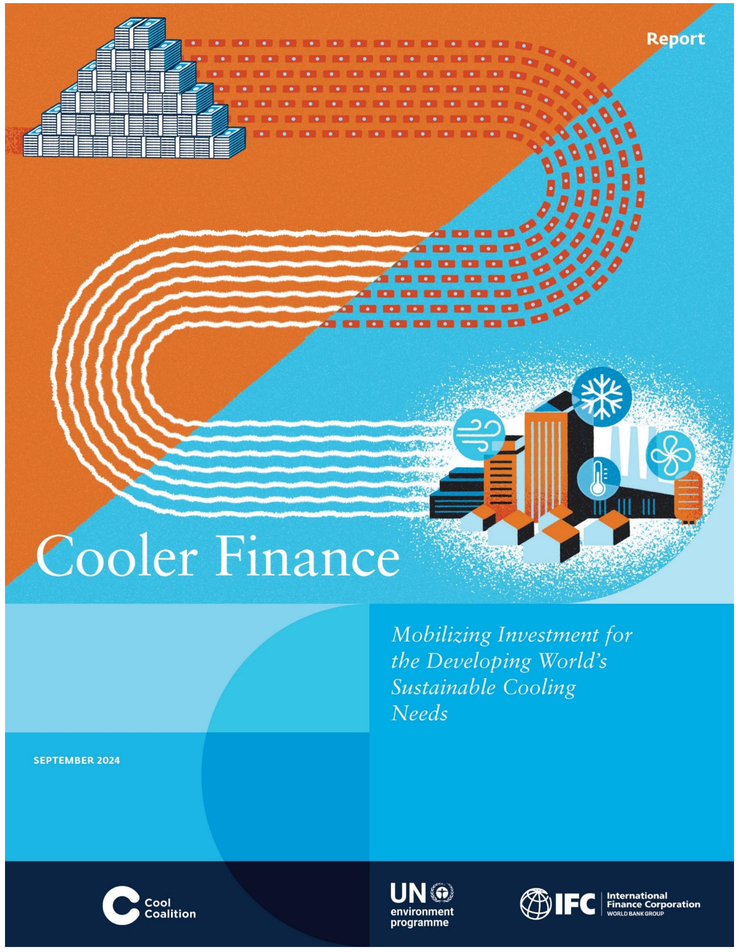


* Probable Maximum Loss (PML) current replacement cost, including structural and equipment, excluding operational costs

Further resource: *BRI Website*
BRI YouTube Channel

IFC AND UNEP'S FLAGSHIP PAPER EXPLAINS HOW TO DESIGN PUBLIC POLICY FOR SUSTAINABLE COOLING

DOWNLOAD THE REPORT



- Chapter 3: Solutions for Cooling
- Passive cooling strategies
- Using EDGE to design building codes
- Enabling environment policies
- Cooling as adaptation